

REMARKS

Applicants have amended claim 4 to delete the plural "s" from the term "type." The amendment is typographical and thus does not introduce new matter and its entry is respectfully requested.

Applicants have added new claim 10, which is directed to cells isolated by the method of specifically removing the adherent cells from the bone fragments before isolating the bone derived mesenchymal stem cell population from the fragments. The claim is supported by the specification as a whole, and particularly, for example, paragraphs 46, 57, and 84. Therefore, the new claim does not introduce new matter and its entry is respectfully requested.

Turning now to the specific rejections.

Claims 1-4 and 7-8 were rejected under 35 U.S.C. § 102(b) as being anticipated by Caplan et al. (U.S. Patent No. 5,486,359).

Applicants respectfully disagree. Caplan does not teach all the elements of the claims. Particularly, Caplan teaches mesenchymal stem cells isolated from **bone marrow**, which is not **bone**. The present invention is directed to a mesenchymal stem cell population isolated from **bone**. In other words, applicants have isolated cells with "stem-like" properties from the mineralized matrix of bone. This is a surprising and unexpected finding, based on the existing literature (see, e.g., Tuli et al., Stem Cells 2003; 21:681-693 (Attachment A); and Tuli et al., in Molecular Biotechnology 2003; 23:37-49 (Attachment B)). Bone marrow occupies a central core location in the long bones, encased primarily within highly structured cortical bone. Applicants used here trabecular bone, which is separate and distinct from the central bone marrow of the long bones. More importantly, all bone marrow cells were removed using collagenase treatment of the minced bone fragments (see, e.g., par. 57). Therefore, the only cells left in the preparation after the collagenase treatment are those that are part of the bony osteoid. Applicants here demonstrated that the novel cell population resulted purely from outgrowths from within the bone chips, as no cells are seen in the first week of culture.

Therefore, applicants respectfully submit that Caplan does not anticipate the present claims because it does not teach mesenchymal stem cells isolated from bone, and thus the rejection over Caplan should be withdrawn.

Claims 1, 5, and 9 were rejected under 35 U.S.C. § 102(b) as being anticipated by Gerson et al. (U.S. Patent No. 5,591,625).

Applicants respectfully disagree. Gerson does not teach all the elements of the claims. Specifically, Gerson does not teach mesenchymal stem cells that are isolated from bone. As

discussed above, and incorporated herein by reference, the bone derived mesenchymal stem cells of the present invention are different than the bone marrow derived stem cells. The cell population isolated from bone marrow is additionally heterogenous (see, e.g., par. 6), unlike the more homogenous cell population isolated from the bone. Therefore, Gerson cannot anticipate the claims and the rejection should be withdrawn.

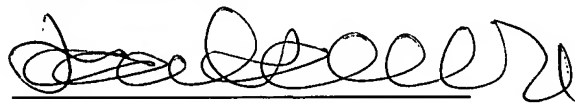
Claim 6 was rejected under 35 U.S.C. §103(a) as being obvious over Gerson in light of Breibart et al. (U.S. Patent No. 6,077,987).

Applicants respectfully disagree. As discussed above, and incorporated herein by reference, Gerson does not teach all the elements of the present claims. Breibart does not overcome this deficiency because Breibart does not teach mesenchymal stem cell population originating from bone. Therefore, applicants respectfully submit that the rejection under 35 U.S.C. §103(a) over Gerson in light of Breibart be withdrawn.

In view of the foregoing, applicants respectfully submit that all claims are now in condition for allowance. In the event of questions, the Examiner is kindly asked to contact the undersigned. Early and favorable action is earnestly solicited.

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Respectfully submitted,



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